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ABSTRACT

Despite revived interest in the study of relationships, the effect of loss of relationships in adulthood has lacked empirical study. To examine the dimensions underlying peoples' conceptions of their attachments in relationships and their reactions to the loss of relationships, 53 college students (31 females, 22 males) completed a questionnaire containing all non-redundant combinations of pairs of 20 relationships, and 15 bipolar scales. Some subjects (N=31) rated the similarity of relationships in terms of attachment, and the remaining subjects (N=22) rated the similarity in terms of loss. An individual differences multidimensional scaling analysis resulted in a two dimensional solution for attachments and for losses. While the dimensional solutions for attachments and loss were similiar, the configurations of relationships in the multidimensional space differed. The bipolar ratings indicated that the first dimension of relationships can be characterized as important versus not important. The second dimension on attachments was labled biological relation versus non-biological relation. For loss, a similiar pattern emerged. (BL)

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# Multidimensional Scaling of Attachments and Relationship Loss

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## ABSTRACT

### Multidimensional Scaling of Attachments and Relationship Loss



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Multidimensional scaling was used to examine the dimensions underlying peoples' conceptions of their attachments in relationships and their reactions to the loss of relationships. Subjects (n=53) completed a questionnaire containing all non-redundant combinations of pairs of 20 relationships, and 15 bipolar scales. Some subjects (n=31) rated the similarity of relationships in terms of attachment, and the remaining subjects (n=22) rated the similarity in terms of loss. An individual differences MDS analysis resulted in a two dimensional solution for attachments and for losses. While the dimensional solutions for attachment and loss were similar, the configurations of relationships in the multidimensional space differed.

## Introduction

### Statement of the Problem

Recent publications indicate a rebirth of interest in the study of relationships, and the effects of the loss of relationships (Bowlby 1969, 1973, 1980; Duck, 1982; Wish, 1975). Several authors, however, have lamented the lack of empirical studies on the loss of relationships in adulthood (Bowlby, 1980, Duck, 1982). This lack of empirical work can be attributed in part to the variety of attachments and relationships that individuals may form in a lifetime, and the many ways in which such attachments can be lost. The first step in any scientific investigation of attachment and relationship loss, therefore, should be a delineation of the dimensions along which they may vary.

The purpose of this study was to identify the dominant dimensions that characterize peoples' attachments and to identify the dimensions that characterize how people feel about the loss of relationships. Rather than enumerate all possible types of relationships that people may have in a lifetime, this study focused only on typical relationships that most people would have some experience with. Also, the relationships included in the present study are often considered to represent emotionally significant relationships for most people. Typical attachments included in the study were family relationships, such as spouse (newlywed, after 30 years of marriage, and after separation or divorce), mother, father, sister, brother, daughter, son, grandparents, grandchildren, and other relatives; friend relationships such as opposite sex friend, same sex friend, and best friend; and sexual relationships (e.g. lover). Recognizing that in any attempt at scaling it is

desirable to have a baseline stimulus, the relationship of "casual acquaintance" was included, inasmuch as people are likely to have little feelings of attachment in such a relationship. In addition, for purposes of establishing a baseline some important but yet non-social relationships were included such as: a pet, job or place of work, and home. Most people have some experience with these types of relationships, and with the loss of such relationships.

At least one previous study has attempted to assess perceived degree of attachment to other member's of one's extended family. Troll and Smith (1976) reported a pilot study designed to determine the strength of people's dyadic bonds in terms of ratings of affect and ratings of frequency of contact and residential proximity. In their study, the highest affect rating was given to the relationship of spouse, followed by mother, father, friends, siblings, and grandparents. The lowest affect rating was given to the relationship of mother-in-law. What is interesting about this study, was the finding that affect was much more important than proximity and frequency of contact in determining the strength of the dyadic bond. Thus, the present study was interested in extending these findings, to determine people's perceptions of these dyadic bonds.

The present study investigated the dimensions underlying peoples' conceptions of these relationships, from the perspective of their attachments and their feelings about the loss of these relationships. To assist in identifying these dimension, we used the technique of multidimensional scaling (MDS). Like factor analysis, the technique of multidimensional scaling is useful in identifying underlying latent constructs. However, MDS has the

advantage that the experimenter's prior expectations about the stimuli under study do not influence the dependent variables (Kruskal & Wish, 1978). Subjects are simply presented with pairs of stimuli (relationships) and asked to rate how similar or how dissimilar that pair is in terms of feelings of attachment, or feelings of loss. MDS then attempts to identify the minimum number of dimensions needed to reproduce the ratings of similarities among all possible pairs of stimuli.

Previous studies of interpersonal relationships, using MDS techniques have found that four dimensions are required to account for most of the variation in ratings of similarity (Wish, Deutsch, & Kaplan, 1976). The difference between earlier studies and the present study is in the choice of relationships used, and in the rating task employed. Whereas previous studies have used a wider range of relationships as stimuli, the present study focused only on close relationships that are typical for most individuals. In previous studies the MDS scaling task involved rating the similarity of pairs of interpersonal relationships. In the present study the rating task for half of the subjects involved rating the similarity of pairs of relationships in terms of feelings of attachment, and for the remaining half involved rating the similarity of pairs of relationships in terms of loss.

Another objective of this study, therefore, was to determine whether a different set of dimensions would be derived for the same set of relationships, by using different instructions to subjects in the rating task. Thus, about half of the subjects were instructed to rate the similarity of their feelings of attachment in each pair of relationships, while the remaining half were instructed to rate the similarity of their reactions to the loss of each pair of relationships.

## Method

### Subjects

Subjects were 31 women and 22 men, recruited from introductory psychology classes. Subjects received course credit for their participation. The average age of these subjects was 23, and most subjects (81%) were single. Subjects received a questionnaire containing the measures described below in a classroom setting. Approximately half of the questionnaires contained the MDS instructions for attachment, and the remaining half contained the MDS instructions for loss. Neither the experimenter nor the subjects knew which MDS instructions (attachment or loss) were contained in the questionnaire that subjects were receiving, until after all questionnaires had been distributed. The same experimenter introduced the study and distributed questionnaires. Subjects were given one hour to complete their questionnaires.

### Procedures

The first portion of each questionnaire obtained basic demographic information including age, sex, and marital status. The second part of each questionnaire asked subjects to complete the Bem Sex Role Inventory (BSRI), which assessed sex-role identity (Bem, 1977). The third part of the questionnaire presented students with the 190 paired comparison ratings of similarities between relationships, and with instructions for rating the similarity of their attachments or reactions to the loss of those relationships. The 190 pairs of the 20 relationship stimuli represent the $n(n-1)/2$ nonredundant pairs of the $n^2$ possible pairs. The twenty relationships used in the present study are listed in Table 1.

Table 1 about here

Twenty-two of the subjects rated the similarity of relationship pairs in terms of loss, and 31 of the subjects rated the similarity of relationship pairs in terms of attachment. Ratings were done on a seven point scale, with the endpoints marked "Very Similar" and "Not at all Similar". The following written instructions were provided to subjects:

> On the accompanying pages you will note pairs or person and object relations, with which we often become emotionally attached. These pairs have been derived by taking two relations at a time from a list of 20 relations. There are 190 pairs of comparisons, thus you will have to work fast. Do not spend too much time rating each comparison. Do try to maintain the same frame of reference throughout all the comparisons. That is, keep in mind that you are rating the similarity of your emotional reactions following the loss of those relations.
>
> For Loss the following additional instructions were provided:
>
> For each pair of relations, please determine how similar your emotional reactions might be if you were to experience losing either relation. That is, rate each pair of relations from very similar (1) to not at all similar (7), in terms of how alike your emotional reactions would be were you to lose either one of the two relations.
>
> For Attachment the following additional instructions were provided:
>
> For each pair of relations, please determine how similar your feeling of attachment is in these relations. That is, rate each pair of relations

from very similar (1) to not at all similar (7), in terms of how alike your feeling of attachment is in the two relations.

The last section of the questionnaire presented students with 15 bipolar scales for each of the 20 relationships. To provide information that would aid in the interpretation of the multidimensional solutions derived from the paired comparison ratings, these subjects were asked to rate all twenty relations on the fifteen bipolar scales. Again a seven point scale was used for the bipolar ratings. The endpoints of the 15 bipolar scales are listed in Table 2.

## Results

Separate analyses were performed for the data obtained on ratings of similarity in attachment, and for data obtained on ratings of similarity in reaction to loss, for the 190 pairs of relationships. An individual differences scaling model (INDSCAL) was employed to analyze the similarities data. A nonmetric analysis was performed, with the data treated as ordinal, and with ties in the data allowed to be untied by the analysis. Multidimensional analyses were performed attachments and for losses in two through four dimensions.

For attachments, a two dimensional solution was an adequate representation of the data, accounting for 62% of the variation in ratings, with a stress value of 0.272. While the three and four dimensional solutions did result in slight improvements in the stress value, the percent of variance accounted for, did not increase substantially. A two dimensional solution for attachments not only accounted for a substantial amount of the variation in ratings, but also made intuitive sense. Figure 1, displays the results of the

individual differences MDS analysis for attachments.

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Figure 1 about here

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Determining the true dimensionality of a solution is not always a straightforward task in MDS. Kruskal and Wish (1978), among others, suggest comparing stress values for different dimensional solutions to derive the true dimensionality of a set of data. In the ALSCAL procedure, stress is defined as the square root of the proportion of total sums of squares of the data which is not accounted for by the model (Young & Lewyckyj, 1979). Thus stress is similar to measures of residual variation in linear regression. $R^2$ is also a helpful measure for determining dimensionality, since it indicates the total variation accounted for by the MDS model. Table 3 presents values of stress and $R^2$ for MDS analyses in two through four dimensions, separately for attachments and for losses.

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Table 3 about here

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For loss, the two dimensional solution also adequately represented the data, accounting for 54% of the variation in ratings, with a stress value of 0.295. Again, the higher dimensional solutions led to slight improvements in the stress value, but no substantial improvements in the percent of variance accounted for. The two dimensional solution was taken as the most parsimonious and the best fitting model for the loss data. Figure 2, displays the results of the individual differences MDS analysis for loss.

Figure 2 about here

The bipolar ratings suggest that the first dimension of relationships can be characterized as important versus not important. Three of the fifteen bipolar scales (bipolar rating scales six, eight, and ten) were significantly correlated with the first dimension on attachments. Thus, relations high on the first dimension are 'difficult to temporarily break off contact with', are viewed as belonging to the person, and are though about almost constantly. These characteristics suggest that this dimension could be characterized as an importance dimension. The third bipolar rating scale correlated significantly with the second dimension on attachments. Thus, individuals perceive much attachment to relations high on the second dimension. Since the relations order themselves on this dimension according to their biological relationship to the person, this dimension was labeled as biological relation versus non-biological relation. For loss, a similar pattern of loadings on the bipolar scales emerged, although none of the correlations were significant.

For both attachment and loss, the pattern was for family relationships to emerge at one end of the first dimension, with casual acquaintance at the other end. On the second dimension, friend relationships emerged at one end, and other relatives at the other end. The first dimension (important versus not important) was more salient for most subjects than the second dimension of biological relation.

The two dimensional solutions for attachment and loss are quite similar to one another, indicating that different instructions for the same set of

stimuli had little effect on subjects ratings of similarity of relationships. However, there were some substantial changes in the position of certain relationships in the two-dimensional space produced by the INDSCAL analysis. This suggests that subjects were attending to the differences in instructions for attachment and loss, and expressing differences in their ratings of the similarity of relationships.

The relationship displaying the greatest difference in the dimensional space for attachment and for loss is that of Wife/Husband (separated). This relation is very high on the first dimension (important/intense) for attachment, but is very low on the first dimension for loss. This suggests that while feelings of attachment to a spouse may remain quite strong following separation or divorce, that in terms of loss, feelings about the spouse would not be very intense.

Similarly, the relation of pet is high on the first dimension for attachment, but low on the first dimension for loss. Other relations showing differences in position within the dimensional space for attachment and loss are the nuclear family relations (brother, sister, son, daughter, mother, and father). These relations are lower on the first dimension on attachment, but are higher on the first dimension on loss.

Most of the differences in position for the twenty relations occurred on the first dimension for attachment and loss. While there were some minor differences in position on the second dimension, none of these differences were substantial.

While the INDSCAL analysis allowed us to examine individual differences in the weight given to the two dimensions for attachment and loss, few

significant differences emerged. There was a tendency for female subjects to give more weight to the second dimension for attachment. There was also a tendency for male subjects to give more weight to the first dimension for losses. However, due to the small number of subjects, neither of these trends were significant by a Chi-square test.

## Discussion

Attachment and loss are familiar concepts to most people. As subjects for scientific inquiry, however, attachment and loss have received limited attention. This study examined people's conceptions of their attachment to twenty close relationships, and their reactions to the loss of those relationships. The dominant dimensions that organize these conceptions of relationships appear to be associated with the importance or intensity of the relationship, and with the degree of biological relationship to the subject.

While the important/not important dimension has been found in previous studies, it has generally not emerged as a dominant dimension in those studies (Wish, Deutsch, & Kaplan, 1976). Differences in the relationships selected as stimuli between this study and previous studies may account for the dominance of that dimension in the present study. Previous studies have generally neglected close relationships that are likely to be in the common experience of most individuals.

The findings of the present study provide data about how individuals perceive close relationships, in terms of both attachment and loss. In addition, these results will add to the growing literature on close relationships, loneliness, and loss in adulthood.

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TABLE 1

RELATIONSHIPS USED FOR SCALING ATTACHMENTS AND LOSSES

1. Same Sex Friend
2. Mother
3. Wife or Husband (newly wed)
4. Casual Acquaintance
5. Best Friend
6. Pet
7. Opposite Sex Friend
8. Brother
9. Lover
10. Father
11. Wife or Husband (after 30 years)
12. Job
13. Sister
14. Grandparents
15. Son
16. Your Home
17. Wife or Husband (after separation or divorce)
18. Daughter
19. Grandchildren
20. Other Relatives

TABLE 2

List of Bipolar Scales

| | (1) | | (7) |
|---|---|---|---|
| 1. | Means very little to me | vs | Is very important to me |
| 2. | Easy to permanently separate from | vs | Difficult to permanently separate from |
| 3. | Would feel little attachment to | vs | Would feel much attachment to |
| 4. | Would not feel emotionally dependent on | vs | Would feel very emotionally dependent on |
| 5. | Would feel little or no emotional stress following loss | vs | Would feel much emotional stress following loss |
| 6. | Easy to temporarily break off contact with | vs | Difficult to temporarily break off contact with |
| 7. | Little emotional investment in | vs | Much emotional investment in |
| 8. | Would not feel possessive of | vs | Might feel possessive of |
| 9. | Could do alright without | vs | Could never get along well without |
| 10. | Almost never think about | vs | Think almost constantly about |
| 11. | Would do very little or nothing to keep from losing | vs | Would do almost anything to keep from losing |
| 12. | Would know exactly how to cope following loss | vs | Would not know what to do following loss |
| 13. | If lonely, would not seek out | vs | If lonely, would seek out |
| 14. | If lost this, would hardly be affected at all | vs | If lost this, would be affected a great deal |
| 15. | If needed consolation, would probably not seek this relation | vs | If needed consolation, would seek this relation |

TABLE 3

Values of Stress and $R^2$ for MDS Solutions

| Number of Dimensions | Attachments | | Losses | |
|---|---|---|---|---|
| | Stress | $R^2$ | Stress | $R^2$ |
| 2 | .295 | .540 | .272 | .615 |
| 3 | .227 | .561 | .212 | .647 |
| 4 | .188 | .579 | .175 | .676 |

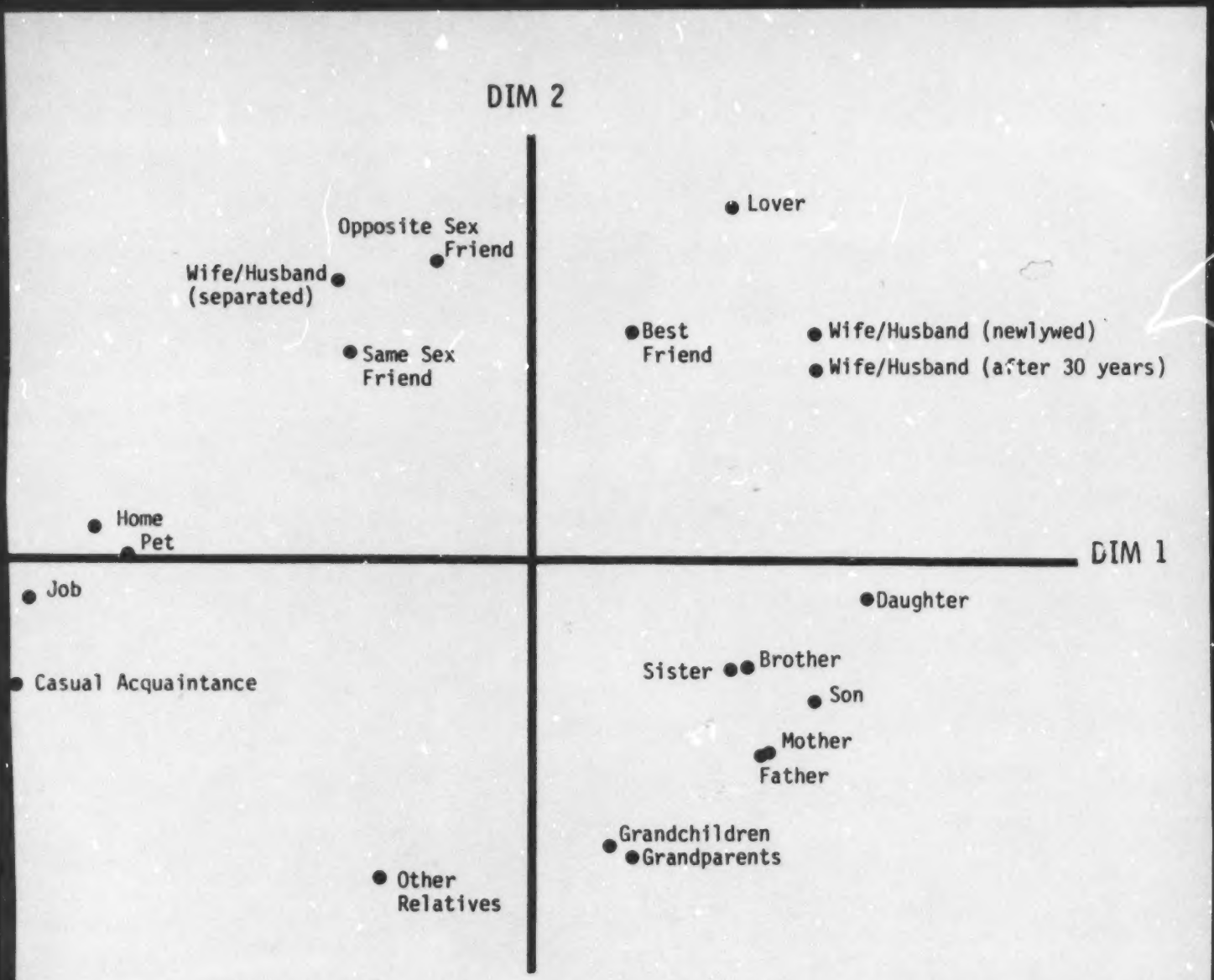


FIGURE 1: Two-dimensional MDS Solution for Attachments

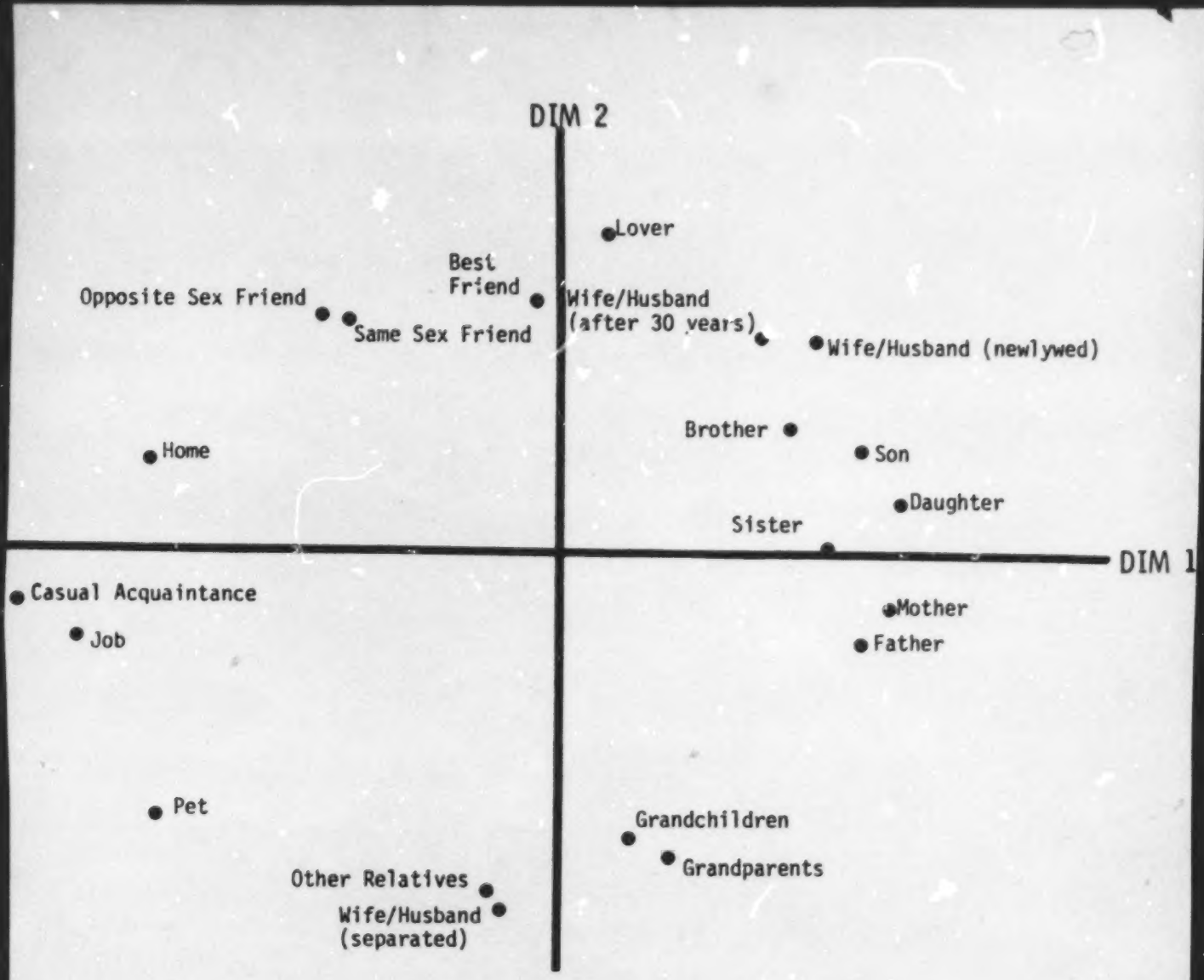


FIGURE 2: Two-dimensional MDS Solution for Losses